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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,373	03/23/2004	Young-Seok Lim	46078	1829
1609 7590 04/18/2007 ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P. 1300 19TH STREET, N.W. SUITE 600 WASHINGTON,, DC 20036			EXAMINER KING, SONIA J	
			ART UNIT 2611	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/18/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/806,373	Applicant(s) LIM, YOUNG-SEOK	
	Examiner Sonia J. King	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eltawil et al US 7106784 B2 in view of Harrison et al US 7010055 B2.

With respect to claim 1, Eltawil et al discloses an apparatus for demodulating signals transmitted from one or more Node-Bs using transmit diversity methods selected on a Node-B basis in a mobile communication system, comprising: a plurality of fingers (Figure 1) assigned on a path-by-path basis for discriminating among multipath signals received from the one or more Node-Bs; a combiner (combining unit 84; Figure 2) for selectively combining signals output from the fingers according to the use of transmit diversity; a transmit diversity controller (controller, 80; Figure 2) for determining a transmit diversity method by considering transmit diversity methods used at the Node-Bs. Rake receivers are known in the art and are called such because of its analogous function to a garden rake, each finger collecting bit or symbol energy similarly to how tines on a rake collect leaves. Each rake finger is able to track the variations that occur over time for its assigned multipath component. (Column 3 lines 38-45) Each rake finger operating in conjunction with the analog front end, has the

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capability of tracking a specific assigned multipath and correcting for the effects of propagation, including phase rotation and frequency and timing drifts. (Column 4 lines 23-27) A combining unit receives signals processed in a plurality of processing units, the combining unit weighting and combining the signals to generate symbol data.

(Column 5 lines 36-39) The controller selects the strongest multipath from each antenna (Column 13 lines 15-18, 34-40) The advantage being that the rake receiver architecture may provide a reduced power consumption receiver. (Column 7 lines 36 and 37)

Eltawil fails to teach a transmit diversity signal processor for demodulating the signals combined by the combiner as in the claimed invention. However, Harrison et al does teach this feature. In Harrison, the receiver combines symbols with a maximal ratio combiner, forming a combined symbol which is demodulated in a demodulator. (Column 8 lines 30-38). The benefit being that this form of error control coding may be used to further improve feedback reliability. (Column 8 lines 42 and 43)

Therefore, taking the combined teaching of Eltawil and Harrison as a whole, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the universal rake receiver as taught by Eltawil to include the transmit diversity signal processor for demodulating the signals combined by the combiner as taught by Harrison so that the whole system would provide a reduced power consumption receiver with improved feedback reliability.

As to claims 2 and 12, refer to the combined teaching above. Note too that Harrison teaches the transmit diversity method comprises one of an open-loop transmit

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diversity method and a closed-loop transmit diversity method in Figure 3. In Harrison, the base transmitter 300 begins with the base channel CH1 as an input to a first of two switches 319 that are controlled with an open/closed loop control signal to route the base channel CH1 through a conventional transmit processor function 316 or an adaptive array processor 321. The conventional transmit processor function 316 may be a filtering arrangement with characteristics established by specifications for the particular communications service or characteristics established from time to time by channel characteristics. Typically if the base transmitter is operating in open loop diversity mode the signal will be routed through the conventional transmit processor 316. By adapting the array on a quasi-continuous basis a signal with better signal to interference can be presented to a receiver as the path to that receiver varies. This may be referred to as closed loop diversity operation. (Column 6 lines 44 – 64, 65-Column 7 line 24)

Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eltawil et al US 7106784 B2 in view of Harrison et al US 7010055 B2. as applied to claim 1 above, and further in view of Hosur et al US 6977910 B1.

As to claim 3 the combined teaching above does not teach the open-loop transmit diversity method comprises one of a time-switched transmit diversity (TSTD) scheme and a space-time transmit diversity (STTD) scheme as in the claimed invention. However, Hosur et al does teach this feature. According to Hosur, the time-switched transmit diversity (TSTD) uses multiple transmit antennas to provide some diversity against fading, particularly at low Doppler rates when there are insufficient paths for the

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receiver. (Column 1 lines 64 – Column 2 line 3) In comparison space-time block-coding-based transmit diversity (STTD). [paragraph 0006] In comparison, in Figure 10B Hosur discloses the advantages of power control for space-time transmit diversity over time switched transmit diversity (Column 4 lines 11 and 12). The advantage being that space-time transmit diversity shows approximately 0.75 dB improvement with respect to TSTD.

Therefore, taking the combined teaching and Hosur as a whole, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined teaching to include the open-loop transmit diversity method as taught by Hosur so that both a time-switched transmit diversity scheme and a space-time transmit diversity scheme would be applied as claimed. Thus enabling the whole system to provide a reduced power consumption receiver with improved feedback reliability and a power control improvement.

As to claim 4 and 14, refer to the combined teaching above. Note also that Hosur teaches the closed-loop transmit diversity method comprises one of a first closed-loop transmit diversity mode for performing a compensation operation by taking into account a phase difference between signals received from antennas of each Node-B, and a second closed-loop transmit diversity mode for performing a compensation operation by taking into account the phase difference and a level difference between the signals received from the antennas of each Node-B in Figure 3.

As to claim 5 and 15, refer to the combined teaching above; note also that it is well known in the art that the combiner, in a rake receiver, selects and combines all

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signals output from fingers using transmit diversity as noted in Eltawil et al. Moreover, the combined teaching also discloses that only first antenna components of signals output from other fingers without using the transmit diversity. (Eltawil, Column 13 lines 40 and 41 and Figure 1)

As to claim 6 and 16, refer to the combined teaching above. Note also that the combined teaching does apply to an apparatus comprising: switches arranged between second antenna component outputs and an input terminal of the combiner so that second antenna component signals can be selectively input into the combiner. (Harrison, Column 11 lines 5962, 64- Column 12 line 2)

As to claim 7, refer to the combined teaching above. Note also that Harrison teaches the switches are turned on/off by the transmit diversity controller or the transmit processor in Figure 3. (Column 6 lines 44-49)

As to claim 8 and 17, refer to the combined teaching above. Note also that according to the combined teaching it would have been obvious to one of ordinary skill in the art, that if the receiver is capable of operating without using transmit diversity and also has the ability to use more than one Node-B then likewise the transmit diversity controller can perform a control operation so that a transmit diversity method of at least one neighboring Node-B is applied to the transmit diversity signal processor where a serving Node-B performs a transmission operation without using transmit diversity. (see Eltawil, Figure 2; Harrison, Figure 3)

3. Claims 9 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Eltawil et al US 7106784 B2 in view of Harrison et al US 7010055 B2 and further in view

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of Hosur et al US 6977910 B1 as applied to claim 3 above, and further in view of Park et al US 6865397 B2.

4. As to claim 9 and 18, the combined teaching above does not teach the transmit diversity controller performs a control operation so that a demodulation operation can be performed. However, Park et al does teach this aspect. According to Park, Figure 2 a base station supporting transmission diversity with a switch controller 213 generates a control signal for a switch 215 which performs the transmission diversity function. The switch 215, under the control of the switch controller 213, switches the transmission signal outputted from the baseband modulator 211 to a first antenna ANT1 or a second antenna ANT2. (Column 4 lines 38-49) Moreover with reference to Figure 3, a demodulation controller 314 controls despreading and decoding operations for the received signal. A baseband demodulator 316 despreads and decodes the received signal under the control of the demodulation controller 314. (Column 5 lines 17-21) The advantage being that a device and method for measuring power of signals output from at least two antennas, and equally controlling power of the signals being transmitted via the antennas is provided. (Column 2 lines 31-38)

5. Therefore, taking the combined teaching and Park as a whole, it would have been obvious to one of ordinary skill in the art at the time of the invention, to modify the combined teaching to include the demodulator and demodulation controller as taught by Park so that a demodulation operation for signals from at least one neighboring Node-B can be performed without using transmit diversity where a serving Node-B performs a transmission operation using predetermined transmit diversity and a transmit diversity

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method of the neighboring Node-B is different from that of the serving Node-B. Thus a device and method for measuring power of signals output from at least two antennas and equally controlling power of the signals being transmitted via the antennas is provided.

6. As to claim 10 and 19, refer to the combined teaching above. Note also that claim 10 and the corresponding claim 19 are rendered obvious by the combined teaching.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sonia J. King whose telephone number is 571-270-1307. The examiner can normally be reached on Mon-Fri 7:30am-5pm alt Fri's off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


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SUPERVISORY PATENT EXAMINER